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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,388	03/25/2004	Steven T. Fink	250826US6YA	5547
22850	7590	11/22/2006	EXAMINER	
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 11/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/808,388

Applicant(s)

FINK, STEVEN T.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 19-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 19-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>20061012</u>                             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application  |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                           |

### **DETAILED ACTION**

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 20 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant's claimed "blind hole" is a term left undefined in the specification as originally filed.

5. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 21 recites the limitation "ball". There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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8. Claims 1-6, 11, 12, 19, 21-26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strang, Eric J. et al. (US 6806653 B2) in view of Serra; Primo (US 3684303 A). Strang teaches a plasma processing device (Figure 1; [0017]-[0026]) comprising: an inject plate (153; Figure 1) including a first hole (133 in 153; Figure 1) with a first diameter ; an upper electrode (154; Figure 1; [0017]-[0026]) including a second hole (132 in 154; Figure 1) – claim 1. Strang further teaches favorable materials for use in plasma processing environments including ceramics such as quartz ([0038]) and silicon (claim 3) as getter material.

Strang further teaches:

- i. The plasma processing device (Figure 1; [0017]-[0026]) of claim 22, wherein the lower electrode (151; Figure 1; [0026]) is disposed directly between the upper electrode (154; Figure 1; [0017]-[0026]) and the inject plate (153; Figure 1), as claimed by claim 23
- ii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 23, wherein the lower electrode (151; Figure 1; [0026]) includes a third hole (132 in 151; Figure 1) axially aligned with axes of the first and second holes, as claimed by claim 24

Strang does not teach:

- i. an upper electrode (154; Figure 1; [0017]-[0026]) including a second hole (132 in 154; Figure 1) with a recessed area having a second diameter larger than the first diameter – claim 1
- ii. a hybrid ball-lock device configured to removably secure Strang's inject plate (153; Figure 1) to Strang's upper electrode (154; Figure 1; [0017]-[0026]) by expanding into the recessed are – claim 1

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- iii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1, wherein the hybrid ball-lock device comprises an actuating hybrid ball-lock device, as claimed by claim 2
- iv. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1, wherein the hybrid ball lock device comprises an actuating hybrid spring-plunger device, as claimed by claim 3
- v. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1 wherein the hybrid ball-lock device comprises a ceramic head, as claimed by claim 4
- vi. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1 wherein the hybrid ball-lock device comprises a quartz head, as claimed by claim 6
- vii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1 wherein the hybrid ball-lock device or threaded (106; Figure 1) shaft is removably connected to a release button, as claimed by claim 11
- viii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1, wherein the hybrid ball-lock device comprises at least one retaining ball, as claimed by claim 12
- ix. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1, further comprising a process chamber (120; Figure 1; [0017]) in which the inject plate (153; Figure 1) is removably secured by the hybrid ball-lock device, and the inject plate (153; Figure 1) is configured to accept insertion to the ball-lock device from inside the process chamber (120; Figure 1; [0017]), as claimed by claim 19
- x. The plasma processing device (Figure 1; [0017]-[0026]) of claim 19, wherein the hybrid ball-lock device comprises a spring with an axis orientated perpendicular to an axis of the

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second hole (132 in 154; Figure 1) configured to push a ball into the recessed area, as claimed by claim 21

- xi. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1, wherein a boundary of the recessed area is formed by a lower electrode (151; Figure 1; [0026]) formed separately from the inject plate (153; Figure 1), as claimed by claim 22
- xii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 24, wherein the third hole (132 in 151; Figure 1) has a third diameter smaller than the second diameter, as claimed by claim 25
- xiii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 22, wherein the boundary is a portion of a seam formed between the upper electrode (154; Figure 1; [0017]-[0026]) and the lower electrode (151; Figure 1; [0026]), as claimed by Claim 26

Serra teaches a ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15) for securing a tool (4; Figures 1; column 2; line 43 - column 3, line 15) including:

- i. A hybrid ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15) comprises an actuating hybrid ball-lock device (column 2; line 43 - column 3, line 15), as claimed by claim 2
- ii. a hybrid ball lock device (Figures 1,2; column 2; line 43 - column 3, line 15) comprises an actuating hybrid spring-plunger device (21; 6; Figure 1,2 column 2; line 43 - column 3, line 15), as claimed by claim 3
- iii. a hybrid ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15) or threaded (106; Figure 1) shaft (6; Figure 1,2 column 2; line 43 - column 3, line 15) is removably

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connected to a release button (8; Figures 1,2; column 3; lines 49-64), as claimed by claim

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- iv. a hybrid ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15) comprises at least one retaining ball (16; Figures 1,2; column 3; lines 10-26), as claimed by claim 12
- v. the hybrid ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15) comprises a spring (21; Figures 1,2; column 2; line 67) with an axis orientated perpendicular to an axis of a second hole (between 1 and 18; Figure 1) configured to push a ball (16; Figures 1,2; column 3; lines 10-26) into the recessed area (26; Figures 1,2; column 2; line 43 - column 3, line 15), as claimed by claim 21

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Strang's securing means (130,132,133; Figure 1) with Serra's ball-lock device (Figures 1,2; column 2; line 43 - column 3, line 15), made of process-compliant materials as taught by Strang.

Motivation to replace Strang's securing means with Serra's ball-lock device, made of process-compliant materials is for "releasably securing two objects" as taught by Serra (column 1; lines 4-6) with insulating materials as taught by Strang ([0038]).

9. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strang, Eric J. et al. (US 6806653 B2) and Serra; Primo (US 3684303 A) in view of Dornfest; Charles N. et al. (US 5680013 A). Strang and Serra are discussed above

Strang and Serra do not teach:

- vi. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1 wherein the hybrid ball-lock devices comprises an anodized aluminum head, as claimed by claim 7

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- vii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 1 wherein the hybrid ball-lock device comprises a metallic head, as claimed by claim 8
- viii. The plasma processing device (Figure 1; [0017]-[0026]) of claim 6 wherein the head is coated with a ceramic material, as claimed by claim 9

Dornfest teaches numerous materials used as plasma facing parts in plasma processing reactors (column 1). Specifically, Dornfest teaches materials of silicon facing material for consumption during processing (column 1; lines 42-63), anodized aluminum (column 1; lines 31-40), aluminum metal (column 1, lines 64-65), and ceramic coatings (column 4; lines 5-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dornfest's plasma process resistant materials in place of Strang and Serra's materials.

Motivation to use Dornfest's plasma process resistant materials in place of Strang and Serra's materials is for protecting plasma-exposed surfaces from attack as taught by Dornfest (column 1; lines 10-20).

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strang, Eric J. et al. (US 6806653 B2) and Serra; Primo (US 3684303 A) in view of Moser; Eva Maria (US 6686302 B1). Strang and Serra are discussed above. Strang and Serra do not teach the plasma processing device (Figure 1; [0017]-[0026]) of claim 1, wherein the hybrid ball-lock device comprises a CRES fastener housing, as claimed by claim 10. Moser teaches a plasma CVD reactor (10, Figure 1) made of corrosion-resistant steel (column 4; lines 30-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Moser's corrosion-resistant steel material in the apparatus of Strang and Serra.



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Motivation to use Moser's corrosion-resistant steel material in the apparatus of Strang and Serra is for corrosion resistance during plasma processing as taught by Serra (column 4; lines 30-38).

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strang, Eric J. et al. (US 6806653 B2) and Serra; Primo (US 3684303 A) in view of Foster; Robert F. et al. (US 5628829 A). Strang and Serra are discussed above. Strang and Serra do not teach the plasma processing device (Figure 1; [0017]-[0026]) of claim 26, wherein the seam is sealed by a compressible seal so as to prevent gas leakage between a process chamber of the plasma processing device (Figure 1; [0017]-[0026]) and an area outside the process chamber, as claimed by claim 27.

Foster teaches a capacitive plasma apparatus (Figure 6) including a compressible o-ring seal (190; Figure 6) sealing his electrode (176; Figure 6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Foster's compressible o-ring seal between Strang's electrodes and Serra's securing means. Motivation to add Foster's compressible o-ring seal between Strang's electrodes and Serra's securing means is for providing a hermetic interface as taught by Foster (column 18; lines 35-45).

### ***Response to Arguments***

12. Applicant's arguments, see After Final Amendment, filed October 23, 2006, with respect to the Examiner's art-based rejections, said arguments have been fully considered and are persuasive. The rejections of claims 1-12 and 19-21 are withdrawn. New grounds of rejection are set forth above.

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*Conclusion*

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

*Rudy Zervigon*  
11/20/6